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zontal habit. Flowering shoots of *Veronica chamaedrys* were made to take the form of an ordinary vegetative shoot by growing them as cuttings in moist air. Many other fascinating experiments are described.

The book is full of suggestive theoretical discussions. In the author's interpretation of these phenomena of higher plants, the responses already obtained in lower plants are taken into account. Thus, the whole manner of treatment is one based on the physiology of the cell itself. On the whole, the work is an admirable one and one which will immediately take its place alongside Dr. Klebs's earlier treatise as among the first to present the subject of development from the standpoint of objective physiology.—BURTON E. LIVINGSTON.

MINOR NOTICES.

THE THIRD PART of Maiden's Revision of the genus *Eucalyptus*³ contains text and figures for *Eucalyptus calycogona* Turcz.—C. R. B.

THE SIXTEENTH PART of Engler's *Das Pflanzenreich* includes a conspectus of the families Scheuchzeriaceae, Alismataceae, and Butomaceae by Fr. Buchenau.⁴—C. R. B.

"WITH THE TREES"⁵ is the title of a recent book which furnishes evidence of the increasing popular interest in the trees and forests. Such subjects as: When the sap stirs, The life of leaves, The work of leaves, In the high woods, In a hillside pasture, Trees of streets, parks, and gardens, are very interestingly treated by the author. The book indicates a thorough knowledge and familiarity with the botanical problems discussed. The usual tendency of popular writers to personify plants is carried to an extreme in many cases. While this may lend a certain vivacity to the style, the practice is unfortunate, because it conveys erroneous impressions of the life-processes and of the probable origin of structures in plants. The book is very well illustrated from photographs by Edmund H. Lincoln and C. B. Going.—CLIFTON D. HOWE.

THE STUDY of the life-history of truffles has lately engaged the attention of several French investigators. On December 10, 1900, M. Émile Boulanger deposited with the Paris Academy of Science a sealed paper, which was opened at his request on May 4, 1903. It contained a description of his success in germinating the ascospores of *Tuber melanosporum* and *T. uncinatum*. He further described the mycelium, and a conidial stage, and announced

³ MAIDEN, J. H., A critical revision of the genus *Eucalyptus*. Part III. pp. 77-90. *pls. 9-12*. Published by the Government of the state of New South Wales. Sydney: W. A. Gullett. 1903. 2s. 6d.

⁴ ENGLER, A., *Das Pflanzenreich*. Heft 16. Scheuchzeriaceae (pp. 19), Alismataceae (pp. 66), und Butomaceae (pp. 12), von Fr. Buchenau. Leipzig: Wilhelm Engelmann. 1903. *M.* 5.

⁵ GOING, MAUD, *With the trees*. 12mo. pp. x+335. *figs. 40*. New York: The Baker and Taylor Co. 1903. \$1.00.

his plans for cultivation of these species on a considerable scale in the open. M. Louis Matruchot later presented a note to the Academy of Sciences in which he announced for the mycelium of these truffles characters absolutely contrary to those given by M. Boulanger. M. Boulanger has now published a quarto pamphlet,⁶ figuring and describing the germination of the ascospores *Tuber melanosporum*, in which he also has reprinted extracts from the proceedings of the Academy of Sciences and the Bulletin of the Mycological Society of France, of various dates. From the description which he gives and the terminology used it would appear that he is absolutely unqualified by a knowledge of the morphology of fungi to discuss the recondite matters upon which he is engaged.—C. R. B.

IN BULLETIN 44 of the Bureau of Plant Industry, von Schrenk and Spaulding⁷ give an excellent account of the bitter rot, which is one of the most serious enemies of the apple industry in the middle states. The bulletin deals first with the disease as it appears on the fruit, and later with the canker stage, which is shown to arise from the infection of wounds by spores, and to enable the fungus to live through the winter. Both phases are illustrated by numerous excellent half-tone engravings. The growth of the fungus in cultures is also treated. In describing the germination of the spores the authors follow the error of many other writers in regarding the appressoria as some kind of "chlamydospore."

From the historical review it appears that the bitter rot fungus has been described under various names on grapes, apples, peaches, and nectarines. Recently the ascus-form of several anthracnoses has been discovered. Those species were separated as a genus, *Gnomoniopsis* Stoneman. Since this name had been previously used, the authors propose the name *Glomerella*⁸ for all anthracnoses whose ascus-form is known. The bitter rot fungus, through synonymy, becomes *Glomerella rufomaculans* Spaulding and von Schrenk. The paper concludes with a very comprehensive bibliography.—H. HASSELBRING.

THE SUCCESS of Dr. Grout's little book *Mosses with a hand lens*, has led him to publish a new and larger work,⁹ of more extended scope. Even this makes no pretensions to being a complete manual, but is intended rather to attract and help students who would otherwise never begin the study of

⁶ BOULANGER, M. ÉMILE, Germination de l'ascospore de la truffe. pp. 20. *pls.* 2. Paris. 1903. Apparently published by the author.

⁷ VON SCHRENK, H., and SPAULDING, P., The bitter rot of apples. Bull. no 44. Bureau of Plant Industry. U. S. Dept. of Agric. pp. 54. *pls.* 9. *figs.* 9. 1903.

⁸ Also published in Science N. S. 17:75. O 1903.

⁹ GROUT, A. J., Mosses with hand lens and microscope, a non-technical handbook of the more common mosses of the northeastern United States. Part I. Imp. 8vo. pp. i+86. *pls.* 10. *figs.* 35. Brooklyn, N. Y., 360 Lenox Road: Published by the author. 1903. \$1.

mosses. Inasmuch as the diagnostic characters of the species are drawn chiefly from the author's experience, every student of mosses may find the book not only convenient for the ready determination of miscellaneous collections, but even helpful in discriminating critical species. Half of the first part is devoted to directions for collecting, preserving, mounting, methods of manipulation, an account of life history and structure, and an illustrated glossary of bryological terms. The beginning of the manual proper occupies the remainder, with descriptions of Sphagnaceae, Andreaeaceae, Georgiaceae, Polytrichaceae, Buxbaumiaceae, Fissidentaceae, and Dicranaceae. The descriptions of families are rather full, the classification following closely Jameson's *Handbook of British Mosses*, and they are accompanied by numerous illustrations of the characteristic structures. Many of the plates are reproduced from the *Bryologia Europaea*, some from Sullivant's *Icones Muscorum*, while a goodly number of illustrations are original. The book deserves hearty welcome from teachers and students.—CHARLES J. CHAMBERLAIN.

NOTES FOR STUDENTS.

ATTENTION SHOULD BE CALLED to an important article by F. Cavers¹⁰ on asexual reproduction and regeneration in Hepaticae. The paper supplements the extensive work of Correns on similar phenomena in the mosses.—C. R. B.

MR. W. C. W[ORSDELL] writes a historical sketch¹¹ of the phenomenon of "double fertilization" in angiosperms in which most of the literature of the subject is mentioned except the work of American students, and this is conspicuous by its absence.—C. R. B.

DR. EMERICH ZEDERBAUER holds¹² that two of the Myxobacteriaceae described by Thaxter, *Myxococcus incrustans* and *Chondromyces glomeratus*, and probably all members of the group, are compound organisms, like lichens, a true fungus on the one hand in symbiosis with a bacterium on the other. He has grown each component separately in pure cultures and studied their characteristics.—C. R. B.

M. PH. EBERHARDT has made an extended study of the influence of dry air and humid air upon the form and structure of plants.¹³ The work was carried on at the botanical laboratory of the Sorbonne and the experimental grounds at Fontainebleau. Plants growing in the ground were covered with

¹⁰CAVERS, F., Asexual reproduction in Hepaticae. *New Phytologist* 2:112-133, 155-165. *figs.* 8. 1903.

¹¹W[ORSDELL], W. C., The phenomenon of "double fertilization" in angiosperms; an historical sketch. *New Phytologist* 2:145-155. 1903.

¹²ZEDERBAUER, EMERICH, Myxobacteriaceae eine Symbiose zwischen Pilze und Bacterien. *Oesterr. Bot. Zeits.* 53:309. 1903.

¹³EBERHARDT, PH., Influence de l'air sec et de l'air humide sur la forme et sur la structure des végétaux. *Ann. Sci. Nat. Bot.* VIII. 18:61-153. *pl.* 1. 1903.